

Two Sided

AN ELECTRICAL CABINET AND A FRAME THEREFOR

This invention relates to frames for electrical cabinets and to electrical cabinets.

Electrical cabinets for receiving electronic and electrical components, are used in connection, for example, with the operation of local data networks. The components, for example, subracks with electronic and electrical components, fans and other accessories are mounted within the cabinets on internal frames. The cabinets generally have side panels, a door and end panels that surround and are mounted on the frame.

These electrical cabinets require access for cables, which are often thick and unwieldy, and also for people to service the appliances. Conventional frames have substantial die-cast end members. One frame of the prior art is designed with end members that have recesses in the sides, these recesses can be used for cable access so that, with the side panels of the cabinet removed, cables do not need to be threaded through access holes. Despite the advantages of side recesses these end members are nevertheless, bulky, expensive to manufacture and the space for the cables is limited.

According to one aspect of the invention there is provided a frame of an electrical cabinet, said frame comprising:

two transverse members disposed at opposite ends of the frame and connected together by at least two side members, each of the transverse member having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member having a recess in a substantial part of said at least one side.

The device of the present invention overcomes or at least alleviates the problems of the prior art by providing transverse members which are skeletal in form, making them cheap to manufacture. The skeletal form also provides for large recesses which allow good cable access and also enable service personnel to place their feet inside the cabinet giving them better access to the electronic equipment they are servicing. Thus the present invention can provide a frame for an electrical cabinet with improved performance and at approximately two thirds of the price of the frames of the prior art.

Advantageously, the frame has four of the side members. The provision of four side members and transverse members at either end of the frame can provide a robust construction for the frame.

In preferred embodiments, the transverse member is formed from two bars or tubes connected together. Advantageously, these two bars or tubes have the same shape and are

connected at and around points half way along their respective lengths. The use of bars or tubes having substantially the same shape reduces manufacturing costs.

5 The tubes or bars may, advantageously, be substantially "U" shaped and may be connected together at the bases of the two "U"s. This provides a robust shape from a small amount of material. It also provides large recesses in the sides which are convenient for cable and personnel access.

10 In some embodiments, the base of the "U" shaped bars or tubes are substantially straight. This arrangement allows for the two bars to be more easily and robustly joined together. This is particularly so if they are welded or brazed together. Welding and brazing provide a convenient, strong and cost effective way of joining the two components.

In an alternative embodiment, the bars or tubes are joined to form a substantially cross shape, preferably an elongate cross shape wherein the end portions of one side of said elongate cross is parallel to the other side. This arrangement also provides for large side recesses.

15 In some embodiments, the transverse member may comprise further strengthening bars or tubes connected to both of said two tubes or bars.

20 According to another aspect of the invention, there is provided an electrical cabinet comprising a frame as described above and further comprising removable side panels, end panels and/or doors. Electrical cabinets may require the various components to be interchanged or serviced and therefore the provision of side and end panels that are easily removable is very convenient. Although these panels and doors may be screwed on, in preferred embodiments they are attached to the frame by hooks thereby facilitating their removal.

25 Although the side panels may be mounted directly to the frame, in some embodiments they are mounted on cantilevers extending out from the frame. This arrangement allows for extra space at the sides of the cabinet.

Embodiments of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 illustrates a frame according to an embodiment of the present invention;

Figure 2 illustrates the frame of Figure 1 with associated side and end panels and a quick-release door;

30 Figure 3 illustrates a portion of an electrical cabinet according to another embodiment of the present invention;

Figure 4 illustrates a transverse member for a frame according to an embodiment of the present invention.

Figure 1 illustrates a frame according to an embodiment of the present invention. The frame 10 comprises tubular side members 20, connected together by two tubular transverse members 30 at either end of the side members. The tubular transverse members comprise two straight based "U" shaped tubes 32, 34 welded together. Although in preferred embodiments the transverse member is comprised of tubular members welded together it may alternatively be formed of bars, and the two pieces may be crimped or screwed together.

Figure 2, illustrates side panels 40, an end panel 50 and a removable door 60 that are mounted on the frame of Figure 1 to form an electrical cabinet. The removable door is mounted via hooks 62 in holes (not shown) on the side members 20 of the frame 10, thereby forming a quick-release fitting. The end panel 50, has a ventilation hole 52, and cable access recesses 54. Electrical cabinets typically have a width of 19" (approximately 48cm). They are often mounted on wheels (not shown) for ease of movement.

Figure 3 illustrates a view of a portion of an electrical cabinet 70 according to an embodiment of the present invention. This electrical cabinet 70 has no end member. Electrical cabinets that are the same height as the room in which they are located, with cabling coming down from the ceiling, are often used, such electrical cabinets generally have no end members. In this embodiment the side panels 40 have ventilation holes. The side members 20 of the end frame comprise holes 22 which receive hooks attached to elements to be mounted in the electrical cabinet.

Figure 4, illustrates an alternative embodiment of the transverse member 30 of the frame. This member is formed of two main bars or tubular members 36 welded together to form an elongate cross shape. Additional strengthening bars or tubes 38 may be used to support the structure. Although it is preferred to weld or braze the two portions together they may also be attached by crimping, or by screw attachments.

CLAIMS

1. A frame (10) of an electrical cabinet, said frame (10) comprising:
 - 5 two transverse members (30) disposed at opposite ends of the frame (10) and connected together by at least two side members (20), each of the transverse member (30) having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member (30) having a recess in a substantial part of said at least one side.
 - 10 2. A frame for an electrical cabinet according to claim 1, wherein each transverse member (30) is formed from two bars or tubes (32, 34, 36) connected together.
 - 15 3. A frame for an electrical cabinet according to claim 2, wherein the two bars or tubes (32, 34) have substantially the same shape and are connected together at and around half way along their respective lengths.
 - 20 4. A frame for an electrical cabinet according to claim 2 or claim 3, wherein the two bars or tubes (32, 34) are substantially "U" shaped and are connected together at the bases of the two "U's.
 5. A frame for an electrical cabinet according to claim 4, wherein the bases of the substantially "U" shaped bars or tubes (32, 34) are substantially straight.
 - 25 6. A frame for an electrical cabinet according to any of claims 2 to 5, wherein the two tubes or bars (32, 34) are welded or brazed together.
 7. A frame for an electrical cabinet according to claim 2, wherein the bars or tubes (36) form a substantially cross shape.
 - 30 8. A frame for an electrical cabinet according to claim 7, wherein said cross shape is elongate such that the end portions of one side of said elongate cross is parallel to the other side.

9. A frame for an electrical cabinet according to any of claims 3 to 9, wherein said transverse member (30) includes additional bars or tubes (38) connected as strengthening members to both of said two tubes or bars (36).

5 10. A frame (10) for an electrical cabinet according to any of the preceding claims, the frame (10) including four of the side members (20).

11. A frame for an electrical cabinet according to claim 10, wherein the four side members (20) comprise four bars or tubes.

10 12. An electrical cabinet comprising a frame (10) according to any of the preceding claims, the electrical cabinet further comprising removable side panels (40).

15 13. An electrical cabinet according to claim 12, further comprising at least one removable end panel (50).

14. An electrical cabinet according to claim 12 or 13, further comprising at least one removable door (60).

20 15. An electrical cabinet according to any one of claims 12, 13, and 14 wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

25 16. An electrical cabinet according to any one of claims 12 to 15, wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

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